

CINT Gateway to Los Alamos

The Center for Integrated Nanotechnologies (CINT) is a Department of Energy/Office of Science Nanoscale Science Research Center.

Jointly operated by Los Alamos and Sandia National Laboratories as a national user facility, CINT is devoted to establishing the scientific principles that govern the design, performance, and integration of nanoscale materials. Through its Core Facility and Gateways to both Los Alamos National Laboratory (LANL) and Sandia National Laboratories, CINT provides access to the tools and expertise needed to explore the continuum from scientific discovery to the integration of nanostructures into the micro- and macro worlds.

The Gateway to Los Alamos Facility is on the Los Alamos campus, providing the user community direct access to nanoscale materials science and bioscience capabilities. It is located in the center of LANL's materials science complex, which is in the open security environment and enables easy access to existing nanoscale materials science and bioscience resources. Traditionally, materials science and bioscience have been viewed as separate activities and are housed primarily in separate parts of the Laboratory campus. The Gateway to Los Alamos provides CINT users with a unique research environment that combines nanoscale materials science and biosciences capabilities and expertise under one roof, surrounded by supporting resources accessible to CINT users.

The CINT Core Facility in Albuquerque contains capabilities and expertise needed to support all CINT scientific thrust areas and creates a highly interactive environment to incubate new cross-disciplinary research teams focused on nanoscience integration challenges. It features low vibration for sensitive characterization, chemical/biological synthesis labs, a clean room for device integration, interaction areas and conference rooms, visitor office space, and high-speed communications. To ensure open access to the user community, the Core Facility is located on Department of Energy property on Eubank Avenue outside of Kirtland Air Force Base.

The Gateway to Sandia Facility is housed in a National Nuclear Security Agency building located on the main Sandia National Laboratories campus within the air base. It focuses on nanomaterials and microfabrication from the Integrated Materials Research Laboratory. This Gateway is colocated with many of Sandia's facilities for nanoscale science research and world-class micro-fabrication facilities. Although the National Nuclear Security Agency building containing the CINT Gateway to Sandia is within the Kirtland Air Force Base boundaries, it is located outside classified restricted boundaries and is therefore open for general user access.



CINT Gateway to Los Alamos is a 36,500-square-foot nanoscience facility.



Nanotechnology is the creation and manipulation of materials, devices, and systems through the control of matter at the nanometer-length scale, and at the level of atoms, molecules, and supramolecular structure.

Nanoscience will fundamentally change the way materials and devices are produced and revolutionize the production of virtually every fabricated object.

Fast facts

The CINT Gateway to Los Alamos features the following laboratories:

Ultrafast Spectroscopy	Pulsed Laser Deposition
Physical Synthesis	Optical Microscopy
Self Assembly	Biochemistry/Molecular Biology
Nano Fluidics/LB Thin Films	Visualization Graphic
Scanning Probes (NSOM, AFM, nanoinductor, SEM)	Computational Cluster
	Chemical Synthesis and Characterization

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Center for Integrated Nanotechnologies scientific thrusts



Discovery Platforms™

Modular microlaboratories designed for the purpose of integrating nano- and micro-length scales and for the study of physical and chemical properties of nanoscale materials and devices, Discovery Platforms™

Platforms™ allow easy access to a wide range of CINT external diagnostic and characterization tools.

Born from CINT's need to provide a user-friendly environment where a wide range of scientists from backgrounds and disciplines can explore the interplay between microfabricated architectures and nanoscale materials and devices, Discovery Platforms™ provide the opportunity to explore issues around the central theme of nanoscience integration.



The 95,000-square-foot nanoscience CINT Core Facility in Albuquerque.

Nanophotonics and nanoelectronics

The nanophotonics and nanoelectronics thrust addresses the overall scientific challenge of understanding and controlling fundamental photonic, electronic, and magnetic interactions in nanostructured materials. The thrust area will support user programs both in nanophotonics and nanoelectronics and in areas that require the integration of capabilities from this thrust with other CINT thrusts.

Nano-bio-micro interfaces

The nano-bio-micro-interfaces thrust area focuses facilities and expertise at the intersection of nanoscale materials science and biological or biomolecular science. The capabilities in this thrust area facilitate study of general scientific topics and provide support for CINT's user program.

Nanomechanics

The nanomechanics thrust focuses on scientific problems involving the mechanics of nanostructured and nanoscale materials; the interaction of mechanical systems or mechanical strain with biological, electrical, and optical systems; the transduction of electrical, chemical, and magnetic energy to mechanical actuation; the synthesis of nanostructured and nanoscale materials; the synthesis of micro- and nanoscale mechanical devices; and the characterization of the mechanical behavior of these materials and devices.

Complex functional nanomaterials

The complex functional nanomaterials thrust focuses facilities and expertise in materials synthesis, interfacial science, self-assembly, advanced characterization, and theory to obtain fundamental understanding of structure/function/property relationships over multiple length and time scales. Theory will play a central role in advancing the goals of this thrust. This is especially true with regard to rational nanomaterials synthesis and nanoscale measurement interpretation.

Theory and simulation

The theory and simulation thrust is focused on the interplay between quantum and classical processes at nano- meso- microlength and time scales. The thrust strives to provide unified descriptions of relevant energy, mechanical, optical, electronic and chemical processes in hard, soft, and biological systems that address multiscale functions of these systems. Together with the experimental thrusts, CINT accomplishes this by motivating future experimental and theoretical science challenges and directly supporting users.